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PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements relating to Closures for Fluid Containers.

I, DENIS JAMES BATTERSBY, a British Subject, of "Tylers", Berry Barn Lane, West Wittering, Sussex, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a closure cap for orifices in fluid containers, for example for closing the filler orifice of the fuel tank of a motor vehicle.

It has been proposed to make a filler cap in which helically inclined flanges projecting radially outwards from a spigot on the underside of the cap engage under pegs projecting inwards from the sides of the neck of the orifice, so that rotation of the cap draws the cap down onto the neck. However, vibration is liable to make such a cap come loose, so that not only is fuel spilt but also the cap may be lost. It is known to provide recesses in the inclined surfaces, in which the pegs engage when the cap is tightened down, but whilst this may be effective when the cap is new, there is nothing to compensate for wear, particularly of the washer which is usually placed under the cap, or to allow for distortion of the parts in use, or imperfections in manufacture, so that such a cap may still become insecure after a long period of use.

According to my invention it is now proposed to make at least two peripheral serrations in each flange portion, and preferably a succession of serrations, so that when wear takes place, or when the parts distort, the pegs or other inward projections in the neck of the orifice always engage suitable serrations for holding the cap on firmly in spite of vibration. The tightening down of the cap compresses the usual washer on the cap and the angular movement will be arrested

when the compression of the washer is such that resistance to movement of the pegs over into the next serrations is greater than can be overcome by the normal turning moment applied to the cap. The pegs then rest in the last serrations into which they have moved and locate the cap securely against reverse movement under vibration, and at the same time the washer is held compressed so that escape of fuel is prevented. If the washer should wear the wear is automatically taken up by a further angular movement of the cap to bring the pegs into further serrations along the inclined portions of the disc. Any slight distortion of the disc will be taken up in the same way.

An example of a filler cap for a motor vehicle fuel tank embodying the invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is an exploded view of the cap showing its various component parts.

Figure 2 is an underneath plan view of the assembled cap.

Figure 3 is partly sectioned elevation of the cap in position on the neck of the filler orifice.

Figure 4 is an elevation of the disc alone.

The body of the cap is shown at 1 and is a sheet metal pressing having a peripheral flange and a central downwardly extending spigot 2 to which is secured, by means of rivets 3, a disc 4. The periphery of the disc has two diametrically opposed notches 5. Those portions 6 of the periphery between the notches are gently helically inclined with respect to the plane of the disc, as will be seen in Figure 4, to form portions of a two start thread.

The notches 5 are conveniently formed by piercing an L-shaped slit in the periphery of the disc 4 and bending the tongue 7 so

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formed at right angles to the plane of the disc to form a stop for the corresponding peg in the neck, preventing the cap from being turned in the wrong direction.

5 The body 1 is enclosed in an ornamental cover 8 provided with a knurled periphery to afford a good grip for the user's hand, and there is a flexible pigtail 9 by means of which the cap can be secured to some part  
10 of the vehicle to eliminate any risk of losing it.

The cap fits onto a filler neck 10, as shown in Figure 3, provided with two diametrically opposed pegs 11 (of which only one is visible) projecting inwards from its walls. The notches 5 allow the disc to pass  
15 below the pegs 11 and then partial clockwise rotation of the cap causes the upper sides of the peripheral helical portions 6 to engage under the pegs 11 and to draw the cap tightly down onto the filler neck, compressing a synthetic rubber washer 12 which  
20 lies in the wall of the body 1 and forming an effective seal.

25 To prevent the cap from becoming unscrewed when subjected to vibration, the helical portions 6 are provided with shallow radial serrations 13 over which the pegs 11 ride as the cap is rotated. The angular  
30 movement will be arrested when the washer 12 is compressed to such an extent that resistance to movement over the next pair of serrations is greater than can be overcome by a reasonable effort applied to the  
35 cap. The pegs then rest in the last serrations into which they have moved and locate the cap securely against vibration; the washer remains compressed and effectively prevents the leakage of fluid.

40 It will be understood that there could be more than two pegs; if desired, and the helical portions 6 could be formed in other ways than that shown, for example as integral tongues pressed laterally out of the  
45 sides of the spigot on the body 1, enabling a separate disc to be eliminated.

#### WHAT I CLAIM IS:—

1. A closure cap for an orifice in a fluid container having on its underside a spigot  
50 portion adapted to project into the neck of the orifice, and at least two flange portions

projecting radially outwards from the region of the spigot portion, these flange portions being slightly helically inclined to that plane which is perpendicular to the axis of the cap,  
55 and these flange portions each having at least two peripheral serrations, whereby when the flange portions are engaged under corresponding inward projections in the neck of an orifice for which the cap is intended  
60 and the cap is rotated, the projections will engage in the serrations and prevent reverse rotation of the cap under conditions of vibration, irrespective of wear or of any slight distortion of the mating parts.

2. A closure cap according to Claim 1, in which the flange portions are formed in the periphery of a disc secured to the underside of the spigot portion, the flange portions being separated by notches in the  
70 periphery of the disc.

3. A closure cap according to Claim 2 in which the notches are formed by making L-shaped slits in the periphery of the disc and so forming a stop preventing the cap  
75 from being turned in the wrong direction.

4. A closure for the filler neck of a fluid container comprising in combination at least two pegs projecting inwards from the walls of the neck below its rim, and a cap having  
80 a spigot portion adapted to extend into the filler neck, the spigot bearing a disc on its underside of which the periphery has angularly spaced notches corresponding to the pegs and those portions of the periphery  
85 between the notches are slightly helically inclined to the plane of the disc and carry at least two radial serrations, whereby the cap can be placed in position on the neck, the pegs passing through the notches, and  
90 partial rotation of the cap causes the helically inclined portions to engage under the pegs and draw the cap down onto the neck, the serrations acting to prevent any reverse rotation under vibration.

5. A closure cap for a fluid container substantially as described with reference to the accompanying drawings.

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#### PROVISIONAL SPECIFICATION.

#### A New or Improved Cap for Filler and like Orifices.

I, DENIS JAMES BATTERSBY, a British Subject, of "Tylers", Berry Barn Lane, West Wittering, Sussex, do hereby declare this invention to be described in the following statement:—

This invention relates to a new or improved cap for filler and like orifices such

as the filler necks of fuel tanks on vehicles.

In the usual filler cap a transverse spring strip is fixed at its centre to the underside of the cap and the ends of the strip are shaped to engage under pegs or lugs projecting inwardly from the neck when the cap is partially rotated. The spring strips

are expensive and they tend to break or to lose their resilience so that the cap is not securely held in position.

5 According to our invention a filler cap is provided with a substantially rigid metal disc spaced inwardly from the cap and of a diameter slightly less than that of the neck of the orifice, and angularly spaced notches are formed in the periphery of the disc to pass correspondingly spaced pegs projecting inwardly from the neck, the peripheral portions of the disc between the notches being inclined or part-helical so that on partial rotation of the cap the engagement of these portions with the pegs draws the cap downwardly and urges the usual washer in the cap against the outer end of the neck.

10 Preferably the inclined or part-helical portions of the periphery of the disc are provided with shallow radial serrations over which the pegs ride as the cap is rotated. The tightening down of the cap compresses the washer and the angular movement will be arrested when the compression of the washer is such that resistance to movement of the pegs over into the next serrations is greater than can be overcome by the normal turning moment applied to the cap. The pegs then rest in the last serrations into which they have moved and locate the cap securely against reverse movement under vibration, and at the same time the washer is held compressed so that escape of fuel is prevented. If the washer should wear the wear is automatically taken up by a further angular movement of the cap to bring the

pegs into further serrations along the part-helical portions of the disc. Any slight distortion of the disc will be taken up in the same way.

40 In a preferred construction the body of the cap is a sheet metal pressing having a peripheral flange and a central downwardly extending spigot portion of the same axial length as the flange. A resilient washer is located in the space between the flange and the spigot portion. The diameter of the spigot portion is substantially less than that of the filler neck and there is secured to it by rivets a metal disc of a diameter only slightly less than that of the neck. Two opposed notches are formed in the periphery of the disc to pass opposed pegs projecting radially inwardly from the neck. The portions of the periphery of the disc between the notches are displaced to bring them into part helical form and are serrated radially. The notches are conveniently formed by piercing an L-shaped slit in the periphery of the disc and bending the tongue so formed at right angles to the plane of the disc to form a stop for the peg which prevents the cap from being turned in the wrong direction.

60 The body of the cap is conveniently enclosed in an ornamental plated or other cover.

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1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of  
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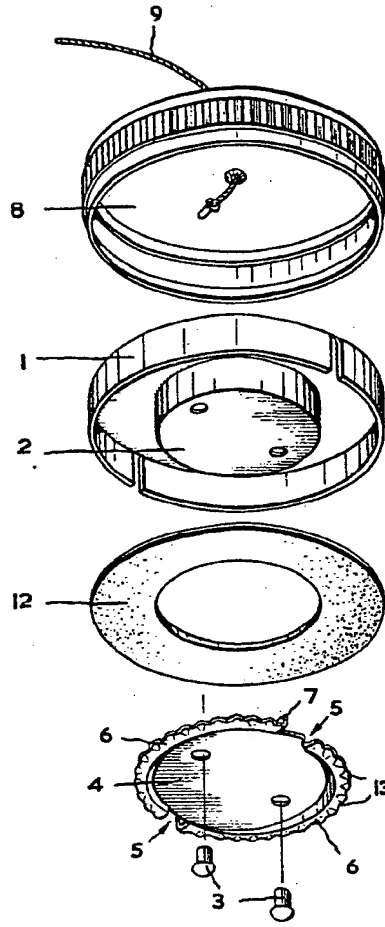


Fig. 1.

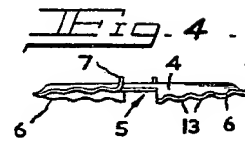


Fig. 3.

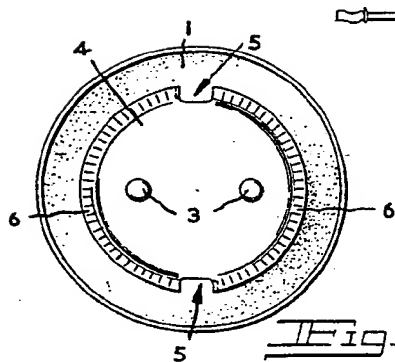


Fig. 2.

